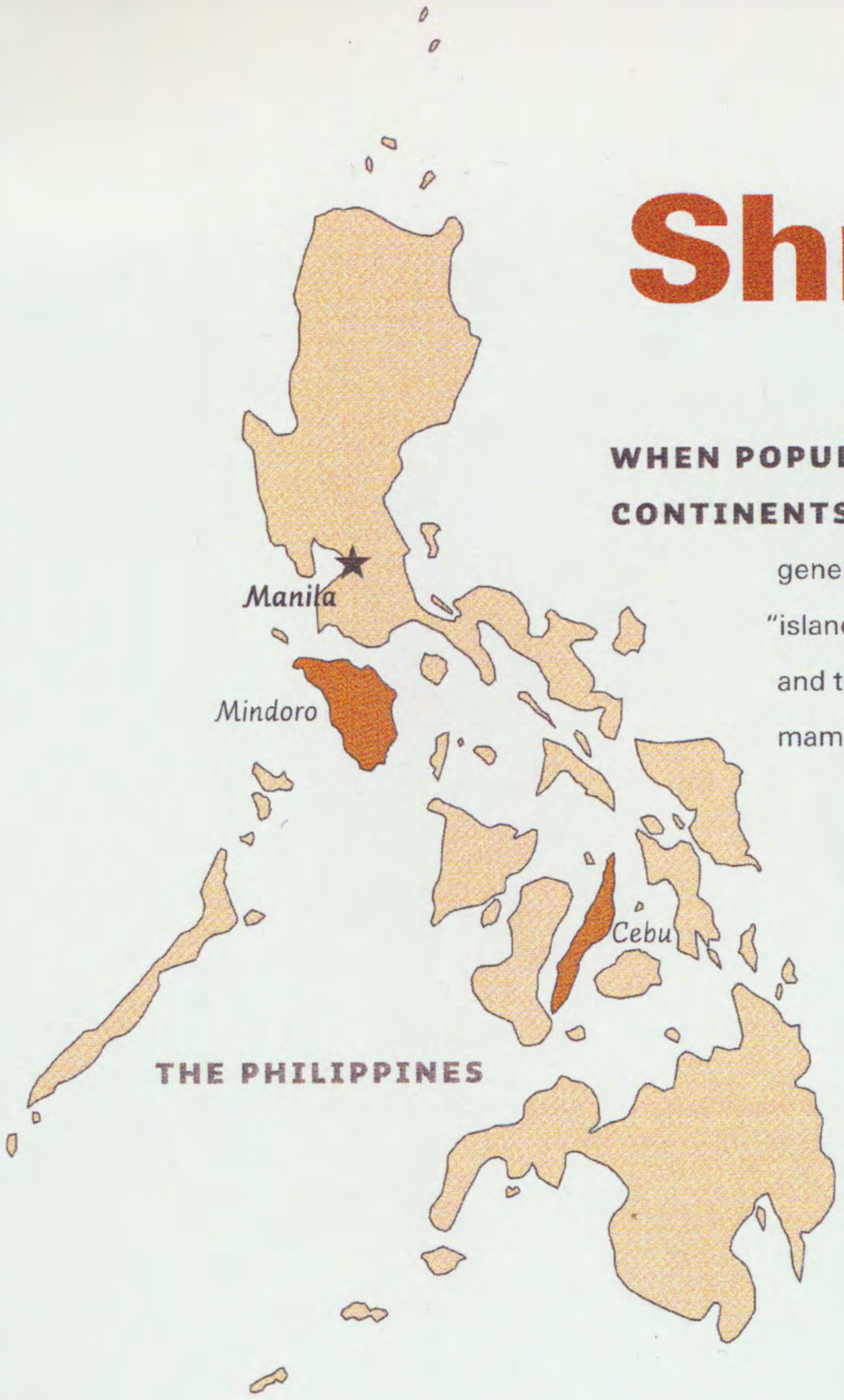
Shrinking Giants

By Lawrence Heaney, Curator and Head of the Division of Mammals



WHEN POPULATIONS OF LARGE MAMMALS PERMANENTLY MOVE FROM CONTINENTS TO ISLANDS, dramatic changes in body size can take place in succeeding generations. My colleagues and I examined a clear case of this phenomenon—known as "island dwarfism"—several years ago, when we studied the partially fossilized bones and teeth of an animal from Cebu Island in the Philippines. We identified the mysterious mammal as a previously unknown species of dwarf water buffalo (*Bubalus cebuensis*).

Long extinct, this tiny buffalo stood about two feet tall at the shoulder and weighed about 330 pounds—only one-sixth the size of a domestic water buffalo (*Bubalus bubalis*)! The extinct Cebu species was even smaller than a living species of dwarf water buffalo from the Philippine island of Mindoro.

Island dwarfism is not confined to the Philippines. Other well-known examples include extinct dwarf elephants from Sicily and Siberian dwarf mammoths from Wrangel Island. The reasons for this "shrinkage" are hot topics for current research; most evidence supports the hypothesis that food on small islands is highly limited, so smaller animals are better adapted to survive on fewer resources. Isolated islands often lack large predators, so there is no benefit in having bigger bodies to fight off tigers or packs of wolves. If these conditions persist over hundreds of generations, and the usual amount of natural genetic variation in a population is present, body size of large mammals—like water buffalo and elephants—will eventually shrink.

Why are so many of these "island dwarfs" extinct? This also is a hot topic—with too few data to make the answer certain. Perhaps it was rapid natural climate change at the end of the most recent ice age; or subsequent rising sea levels caused by melting ice, inundating some islands; or the arrival of humans as predators; or maybe all of these reasons. Whatever the cause, many of the most extreme mammals disappeared recently, and the world is a poorer place for it. ITF

There is still time to experience the extraordinary—and often surprising—world of ***Extreme Mammals*** (closing January 6, 2013). The exhibition explores the ancestry and evolution of mammal species ranging from the huge to the tiny. One featured evolutionary adaption is "island dwarfism" where, over time, giant species shrink to smaller proportions.

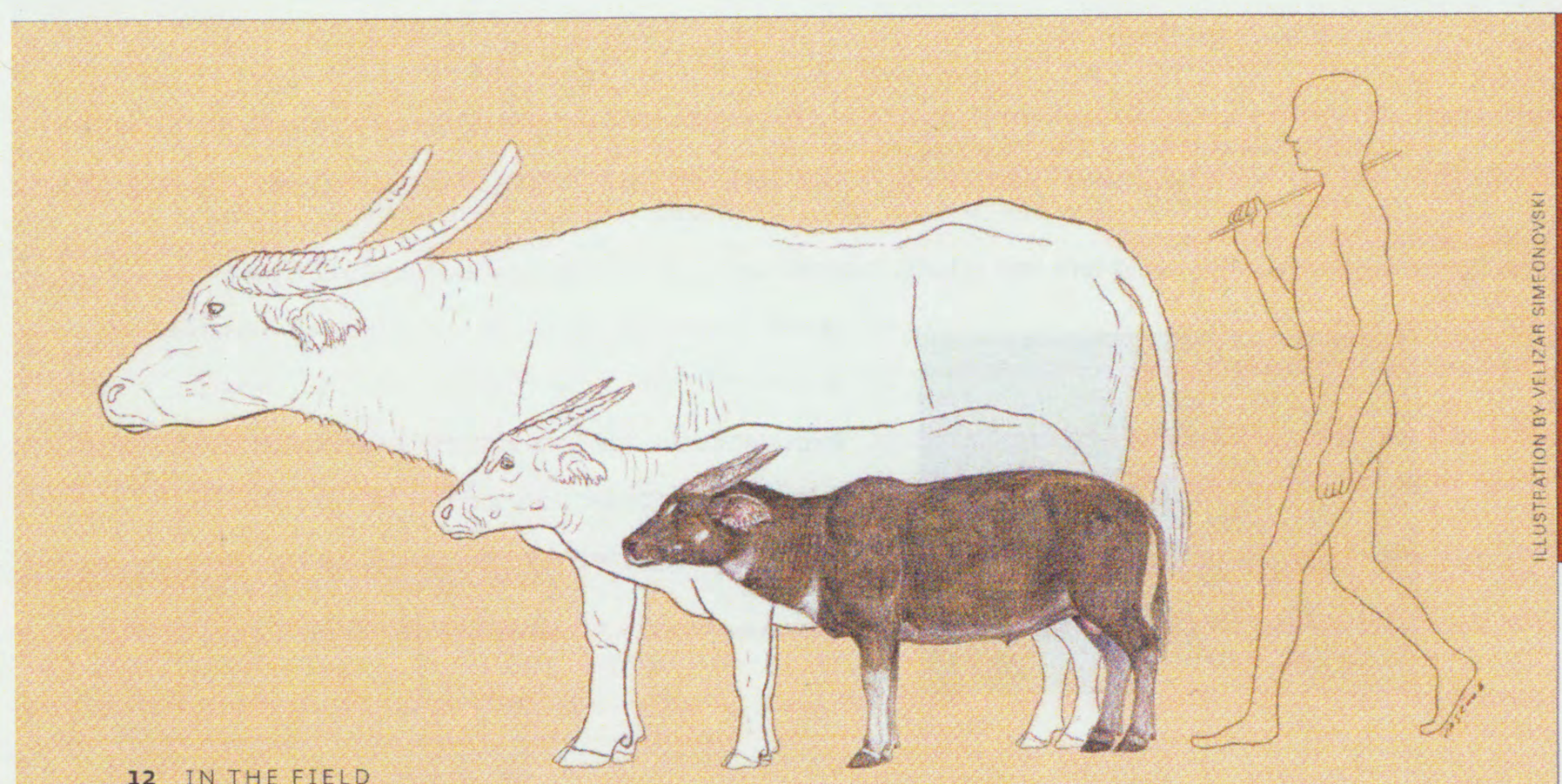


ILLUSTRATION BY VELIZAR SIMEONOVSKI

Three species of Philippine buffalo show dramatic changes in body size due to island dwarfism:

- *domestic water buffalo*
- *living dwarf species from Mindoro Island*
- *fossil species from Cebu Island*